Access DB# 148711

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: DAWN GARRETT Examiner #: 76107 Date: 3/23/2005
Art Unit: 1774 Phone Number ~~30~~ 2-1523 Serial Number: 10/729,328
Mail Box and Bldg/Room Location: Remsen 10C79 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Organic Electroluminescent Devices

Inventors (please provide full names): JOSEPH DEATON, TUKARAM HATWAR, DENIS KONDAKOV, CHRISTOPHER BROWN

Earliest Priority Filing Date: 12/5/2003

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please search formulas (1), (2), (3), and (4) attached

Also search:

formula 7 shown in claim 25

thank you

****

STAFF USE ONLY

Searcher: KA
Searcher Phone #:
Searcher Location:
Date Searcher Picked Up:
Date Completed: 4/6/05
Searcher Prep & Review Time: 30
Clerical Prep Time: 30
Online Time: 180

Type of Search

NA Sequence (#)
AA Sequence (#)
Structure (#) 4
Bibliographic
Litigation
Fulltext
Patent Family
Other

Vendors and cost where applicable

STN $ 838.20
Dialog
Questel/Orbit
Dr.Link
Lexis/Nexis
Sequence Systems
WWW/Internet
Other (specify)

PTO-1590 (8-01)

STIC Search Report
EIC 1700

STIC Database Tracking Number: 148777

TO: Dawn Garrett **Location: REM 10C79** **Art Unit : 1774** **April 6, 2005** **Case Serial Number: 10/729328**	**From: Les Henderson** **Location: EIC 1700** **REM 4B28 / 4A30** **Phone: 571-272-2538** **Leslie.henderson@uspto.gov**

Search Notes

```
=> d his ful

     (FILE 'HOME' ENTERED AT 10:41:26 ON 06 APR 2005)

     FILE 'REGISTRY' ENTERED AT 10:41:43 ON 06 APR 2005
                D SAV
                ACTIVATE GAR738/A
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L1              SCR 1841
L2              STR
L3         4402 SEA SSS FUL L2 AND L1
               ---------
                D QUE STAT L3

     FILE 'LREGISTRY' ENTERED AT 10:42:52 ON 06 APR 2005
L4              STR L2

     FILE 'REGISTRY' ENTERED AT 10:45:50 ON 06 APR 2005
L5            2 SEA SUB=L3 SSS SAM L4
                D SCAN
                D QUE STAT
L6            6 SEA SUB=L3 SSS FUL L4
                D SCAN
                SAV L6 GAR328/A

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L7              STR L4

     FILE 'REGISTRY' ENTERED AT 10:55:43 ON 06 APR 2005

     FILE 'LREGISTRY' ENTERED AT 10:57:46 ON 06 APR 2005
L8              STR L4

     FILE 'REGISTRY' ENTERED AT 11:00:11 ON 06 APR 2005
L9            1 SEA SUB=L3 SSS SAM L8
                D SCAN
                D QUE STAT
L10           5 SEA SUB=L3 SSS FUL L8
                D SCAN
                SAV L10 GAR328A/A

     FILE 'HCAPLUS' ENTERED AT 11:03:42 ON 06 APR 2005
L11           5 SEA ABB=ON  PLU=ON  L6
L12           4 SEA ABB=ON  PLU=ON  L10
L13           5 SEA ABB=ON  PLU=ON  L11 OR L12

     FILE 'REGISTRY' ENTERED AT 11:04:43 ON 06 APR 2005
                E AZOFLUORENE/CN
                E AZAFLUORENE/CN
L14           1 SEA ABB=ON  PLU=ON  AZAFLUORENE/CN
                D SCAN
                E C12H9N/MF
                D RSD
                D L14 FIDE
L15           1 SEA ABB=ON  PLU=ON  97485-90-0/RN
                D SCAN

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L16             STR
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L17          50 SEA SSS SAM L16
                D RSD
L18        2428 SEA ABB=ON  PLU=ON  1839.22.20/RID AND 7-8/NR AND 2-10/N

                SAVE L18 GAR328B/A

     FILE 'LREGISTRY' ENTERED AT 12:40:06 ON 06 APR 2005
L19             STR L16
L20             STR L19

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L21          18 SEA SUB=L18 SSS SAM (L19 OR L20)
                D SCAN
                D QUE STAT

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L22             STR L19

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                D QUE STAT L20
L23           2 SEA SUB=L18 SSS SAM (L20 OR L22)
                D SCAN
                D QUE STAT
L24          92 SEA SUB=L18 SSS FUL (L20 OR L22)
                SAV L24 GAR328C/A

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L25             STR L22

     FILE 'REGISTRY' ENTERED AT 13:03:53 ON 06 APR 2005
L26           2 SEA SUB=L18 SSS SAM (L25 OR L20)
                D SCAN
L27          90 SEA SUB=L18 SSS FUL (L25 OR L20)
                D QUE STAT

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     FILE 'HCAPLUS' ENTERED AT 13:06:22 ON 06 APR 2005
                D SCAN L13
L28         427 SEA ABB=ON  PLU=ON  L27
L29           2 SEA ABB=ON  PLU=ON  L13 AND L28
                D SCAN
L30      134186 SEA ABB=ON  PLU=ON  EL OR E(W)L OR L(W)E(W)D OR OLED OR
                ELECTROLUM!N? OR ORGANOLUM!N? OR (ELECTRO OR ORGANO OR
                ORG#)(2A)LUM!N? OR LIGHT?(2A)(EMIT? OR EMISSION? OR
                SOURCE?)
L31      665574 SEA ABB=ON  PLU=ON  (LUMINES####### OR FLUORES? OR
                PHOSPHORES?)/BI,AB OR LED/IT OR PHOSPHOR# OR LUMIN?
L32         394 SEA ABB=ON  PLU=ON  L28 AND (L30 OR L31)
                E HOST/CT
                E HOSTS/CT
                E SUBSTRATE/CT
                E SUBSTRATES/CT
                E E3+ALL
                E HOSTS/IT
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```
                E E3+ALL
                E HOSTS/CV
                E HOST/CV
L33       193016 SEA ABB=ON  PLU=ON  HOST#
L34          139 SEA ABB=ON  PLU=ON  L32 AND L33
                D QUE
L35               QUE ABB=ON  PLU=ON  LAMEL? OR LAMIN? OR MULTILAYER? OR
                  MULTICOAT? OR MULTIFILM?
L36               QUE ABB=ON  PLU=ON  (MULTI OR MULTIPL? OR PLURAL? OR
                  THREE OR MANY OR NUMEROUS? OR SEVERAL? OR FEW OR
                  MULTIFOLD? OR MANIFOLD? OR MULTITUD?)(2A)(LAYER? OR
                  COAT? OR FILM?)
L37               QUE ABB=ON  PLU=ON  THREEPLY? OR THREEPLIES OR THREEPLIED
                   OR (THREE OR 3)(2A)(PLY OR PLIES OR PLIED OR PLYING#)
L38               8 SEA ABB=ON  PLU=ON  L34 AND ((L35 OR L36 OR L37))
L39           37826 SEA ABB=ON  PLU=ON  IRIDIUM# OR IR(A)METAL#
L40              70 SEA ABB=ON  PLU=ON  L39 AND L34
L41               6 SEA ABB=ON  PLU=ON  L39 AND L38
L42              13 SEA ABB=ON  PLU=ON  L13 OR L29 OR L38 OR L41
L43              11 SEA ABB=ON  PLU=ON  L42 NOT L29
                D QUE STAT

=> => d que stat l29
L1                SCR 1841
L2                STR
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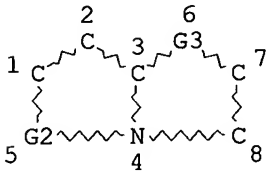


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REP G3=(1-2) C
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DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   8

STEREO ATTRIBUTES: NONE
L3             4402 SEA FILE=REGISTRY SSS FUL L2 AND L1
L4                  STR
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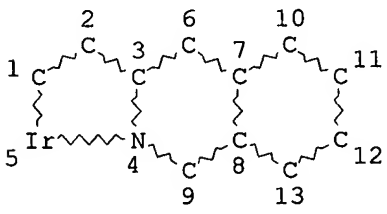


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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED
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GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE
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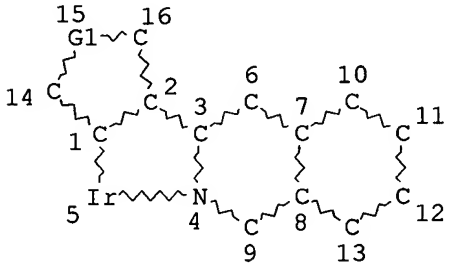
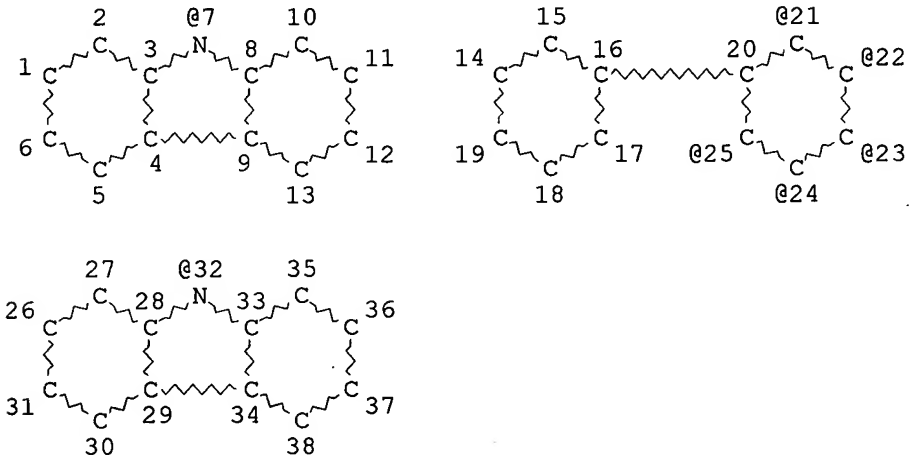
L8 STR



REP G1=(1-2) C
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 16

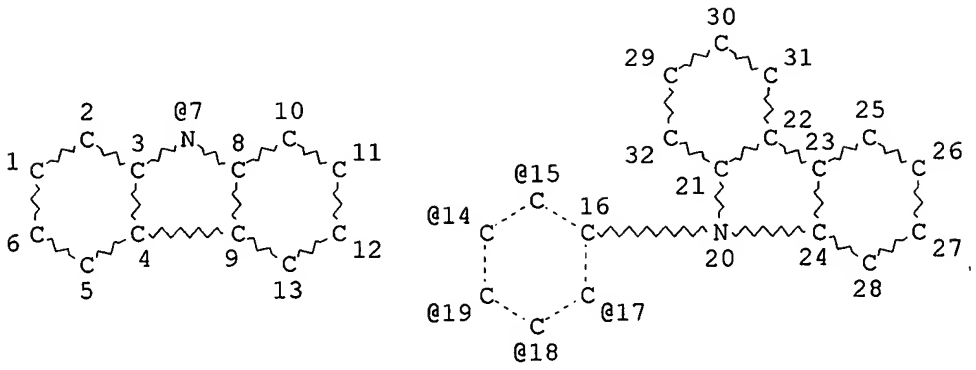
STEREO ATTRIBUTES: NONE
L10 5 SEA FILE=REGISTRY SUB=L3 SSS FUL L8
L11 5 SEA FILE=HCAPLUS ABB=ON PLU=ON L6
L12 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L10
L13 5 SEA FILE=HCAPLUS ABB=ON PLU=ON L11 OR L12
L18 2428 SEA FILE=REGISTRY ABB=ON PLU=ON 1839.22.20/RID AND 7-8/NR AND 2-10/N
L20 STR



VPA 7-14/15/17/18/19 U
VPA 32-21/22/23/24/25 U
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 38

STEREO ATTRIBUTES: NONE
L25 STR



VPA 7-14/15/17/18/19 U
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 32

STEREO ATTRIBUTES: NONE
L27 90 SEA FILE=REGISTRY SUB=L18 SSS FUL (L25 OR L20)
L28 427 SEA FILE=HCAPLUS ABB=ON PLU=ON L27
L29 2 SEA FILE=HCAPLUS ABB=ON PLU=ON L13 AND L28

=> d l29 1-2 ibib abs hitstr hitind

L29 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:710952 HCAPLUS
DOCUMENT NUMBER: 139:237475
TITLE: Iridium complexes as electroluminescent materials and their devices showing high light-emitting efficiency
INVENTOR(S): Hamada, Yuji; Matsusue, Akimasa; Nishimura, Kazuki
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003253256	A2	20030910	JP 2002-51802	200202

27

JP 3605083 B2 20041222
US 2003194580 A1 20031016 US 2003-376099
200302
26

PRIORITY APPLN. INFO.: JP 2002-51802 A
200202
27

OTHER SOURCE(S): MARPAT 139:237475
GI

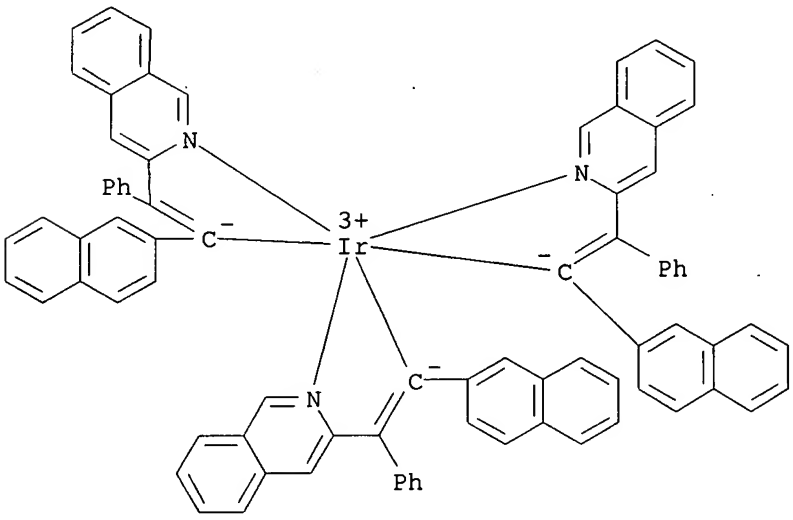
* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB Electroluminescent materials having Markush structures of I, II, III, IV, (R1-6 = H, CnH2n+1, N(CnH2n+1)2, COOCnH2n+1, F, Cl, Br, I, CN, (un)substituted Ph or naphthyl; n = integer of 1-10; D = V, VI) and their benzo derivs. are claimed. Electroluminescent devices comprising layers of the said materials are also claimed. The devices show high emission efficiency and are suitable for use in mobile devices operated under low voltage.

IT **594819-55-3**
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(dopant; Ir complexes as dopants in electroluminescent devices for high light-emitting efficiency under low-voltage operation)

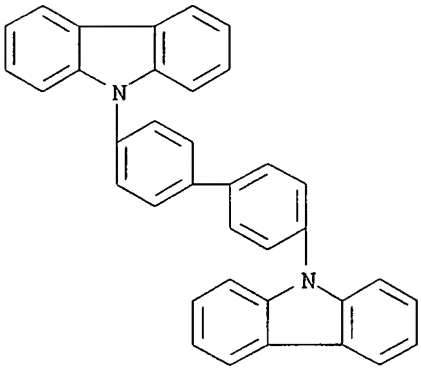
RN 594819-55-3 HCAPLUS

CN Iridium, tris[2-(3-isoquinolinyl-κN)-1-(2-naphthalenyl)-2-phenylethenyl-κC]- (9CI) (CA INDEX NAME)



IT **58328-31-7**
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(host; Ir complexes as dopants in electroluminescent devices for high light-emitting efficiency under low-voltage operation)

RN 58328-31-7 HCAPLUS
CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



IC ICM C09K011-06
ICS C07F015-00; H05B033-14
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 25, 27, 29
IT 594819-47-3 594819-48-4 594819-49-5 594819-50-8 594819-51-9
594819-52-0 594819-53-1 594819-54-2 **594819-55-3**
594819-56-4 594819-57-5 594819-58-6 594819-59-7 594819-60-0
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(dopant; Ir complexes as dopants in electroluminescent devices for high light-emitting efficiency under low-voltage operation)
IT 16756-03-9 **58328-31-7** 139092-78-7 160780-82-5
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(host; Ir complexes as dopants in electroluminescent devices for high light-emitting efficiency under low-voltage operation)

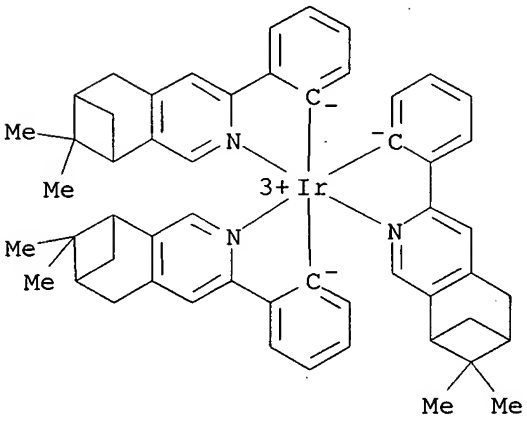
L29 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:788043 HCAPLUS
DOCUMENT NUMBER: 136:60584
TITLE: New iridium derivatives with good electrophosphorescence properties
AUTHOR(S): Liu, Man Wah; Wong, Oi Yan; Xie, Hong Zhi; Wong, Tsz Cheung; Mi, Bao Xiu; Wong, Fu Lung; Chan, Wai Lim; Lee, Chun Sing; Hung, Liang Sun; Tong Lee, Shuit
CORPORATE SOURCE: Center of Super-Diamond and Advanced Films (COSDAF) & Department of Physics and Materials Science, City University of Hong Kong, Hong Kong
SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (2001), 4416(Optical Engineering for Sensing and Nanotechnology (ICOSN 2001)), 466-469
CODEN: PSISDG; ISSN: 0277-786X
PUBLISHER: SPIE-The International Society for Optical Engineering
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The authors synthesize a new Ir complex by introducing sterically bulky spacers into the framework of fac-[Ir(ppy)3] (ppy = 2-phenylpyridine). The main purpose is to reduce concentration quenching in Ir(ppy)3. The new complex exhibits a high (0.71) luminescence (PL) quantum yield in solution The devices fabricated with the new Ir complex as an emitting dopant confirm that concentration quenching is almost negligible even at relatively high doping concns. For example, at a c.d. of 100 mA/cm2, the current efficiency for the devices with 7 and 26% dopants are 8.9 and 10.2 cd/A resp. These characteristics can be explained by a better energy transfer between the host and dopants upon introducing the sterically hindered spacers into the phosphorescent dyes.

IT **376385-24-9**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(electrophosphorescent device using)

RN 376385-24-9 HCAPLUS

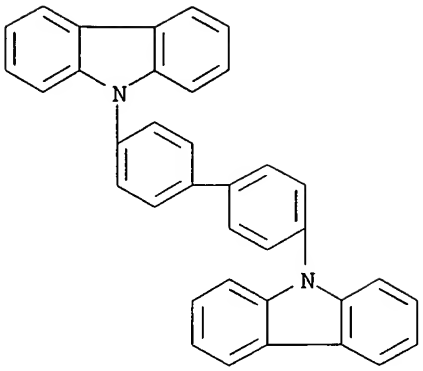
CN Iridium, tris[2-[(6R,8R)-5,6,7,8-tetrahydro-7,7-dimethyl-6,8-methanoisoquinolin-3-yl-κN]phenyl-κC]-, (OC-6-22)- (9CI) (CA INDEX NAME)



IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(electrophosphorescent device using iridium phenylpyridine derivative complex with sterically bulky spacers and)

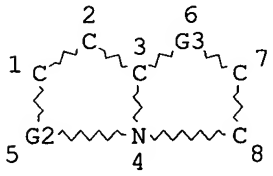
RN 58328-31-7 HCAPLUS

CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
IT **376385-24-9**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(electrophosphorescent device using)
IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 4733-39-5, Bathocuproine **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl 123847-85-8, NPB
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(electrophosphorescent device using iridium phenylpyridine derivative complex with sterically bulky spacers and)
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d que stat l43
L1 SCR 1841
L2 STR



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REP G3=(1-2) C
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 8

STEREO ATTRIBUTES: NONE
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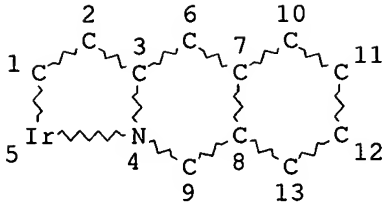
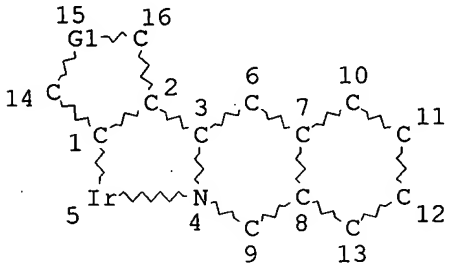
L4 STR



NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 13

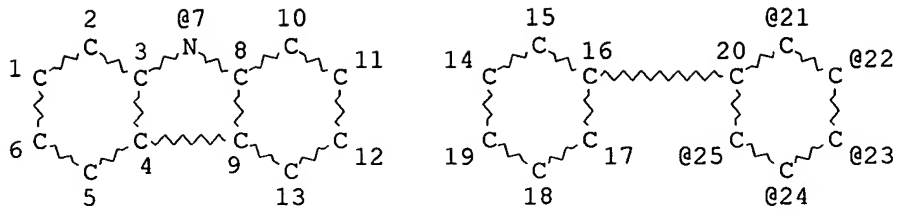
STEREO ATTRIBUTES: NONE
L6 6 SEA FILE=REGISTRY SUB=L3 SSS FUL L4
L8 STR

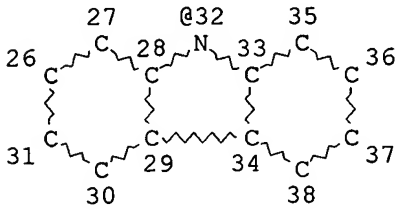


REP G1=(1-2) C
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 16

STEREO ATTRIBUTES: NONE
L10 5 SEA FILE=REGISTRY SUB=L3 SSS FUL L8
L11 5 SEA FILE=HCAPLUS ABB=ON PLU=ON L6
L12 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L10
L13 5 SEA FILE=HCAPLUS ABB=ON PLU=ON L11 OR L12
L18 2428 SEA FILE=REGISTRY ABB=ON PLU=ON 1839.22.20/RID AND 7-8/NR AND 2-10/N
L20 STR

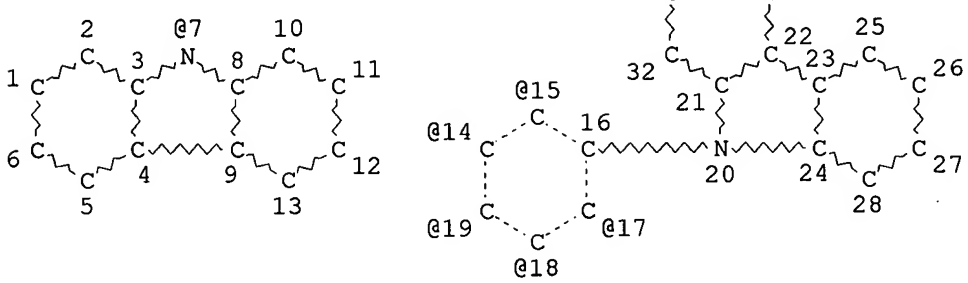




VPA 7-14/15/17/18/19 U
VPA 32-21/22/23/24/25 U
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 38

STEREO ATTRIBUTES: NONE
L25 STR



VPA 7-14/15/17/18/19 U
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

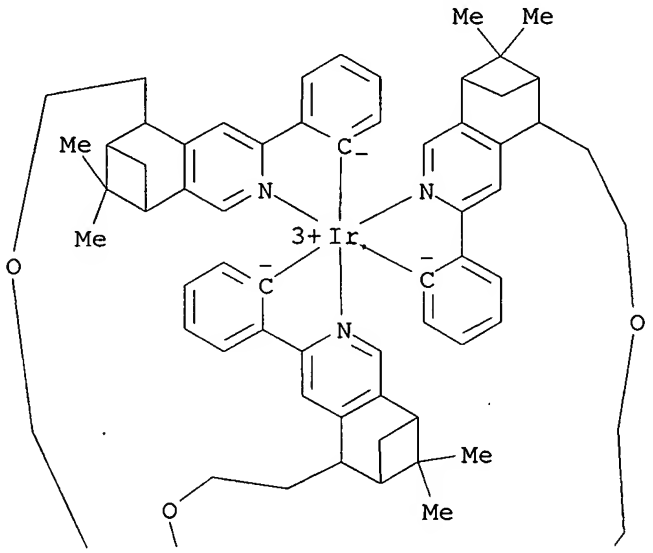
GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 32

STEREO ATTRIBUTES: NONE
L27 90 SEA FILE=REGISTRY SUB=L18 SSS FUL (L25 OR L20)
L28 427 SEA FILE=HCAPLUS ABB=ON PLU=ON L27
L29 2 SEA FILE=HCAPLUS ABB=ON PLU=ON L13 AND L28

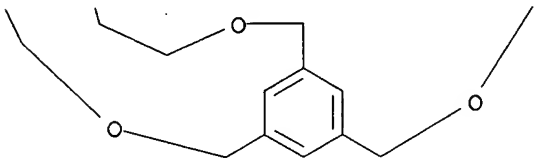
```
L30      134186 SEA FILE=HCAPLUS ABB=ON  PLU=ON  EL OR E(W)L OR L(W)E(W)D
                 OR OLED OR ELECTROLUM!N? OR ORGANOLUM!N? OR (ELECTRO OR
                ORGANO OR ORG#)(2A)LUM!N? OR LIGHT?(2A)(EMIT? OR
                EMISSION? OR SOURCE?)
L31      665574 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (LUMINES####### OR
                FLUORES? OR PHOSPHORES?)/BI,AB OR LED/IT OR PHOSPHOR# OR
                LUMIN?
L32         394 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L28 AND (L30 OR L31)
L33      193016 SEA FILE=HCAPLUS ABB=ON  PLU=ON  HOST#
L34         139 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L32 AND L33
L35             QUE  ABB=ON  PLU=ON  LAMEL? OR LAMIN? OR MULTILAYER? OR M
                ULTICOAT? OR MULTIFILM?
L36             QUE  ABB=ON  PLU=ON  (MULTI OR MULTIPL? OR PLURAL? OR THR
                EE OR MANY OR NUMEROUS? OR SEVERAL? OR FEW OR MULTIFOLD?
                OR MANIFOLD? OR MULTITUD?)(2A)(LAYER? OR COAT? OR FILM?)
L37             QUE  ABB=ON  PLU=ON  THREEPLY? OR THREEPLIES OR THREEPLIE
                D OR (THREE OR 3)(2A)(PLY OR PLIES OR PLIED OR PLYING#)
L38           8 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND ((L35 OR L36 OR
                L37))
L39       37826 SEA FILE=HCAPLUS ABB=ON  PLU=ON  IRIDIUM# OR IR(A)METAL#

L41           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L39 AND L38
L42          13 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 OR L29 OR L38 OR
                L41
L43          11 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 NOT L29


=> d l43 1-11 ibib abs hitstr hitind

L43  ANSWER 1 OF 11  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2004:553509  HCAPLUS
DOCUMENT NUMBER:          141:260859
TITLE:                    Diastereoselective Formation of Chiral
                          Tris-Cyclometalated Iridium (III) Complexes:
                          Characterization and Photophysical Properties
AUTHOR(S):                Schaffner-Hamann, Christine; von Zelewsky,
                          Alexander; Barbieri, Andrea; Barigelletti,
                          Francesco; Muller, Gilles; Riehl, James P.;
                          Neels, Antonia
CORPORATE SOURCE:         Department of Chemistry, University of Fribourg,
                          Fribourg, CH-1700, Switz.
SOURCE:                   Journal of the American Chemical Society (2004),
                          126(30), 9339-9348
                          CODEN: JACSAT; ISSN: 0002-7863
PUBLISHER:                American Chemical Society
DOCUMENT TYPE:            Journal
LANGUAGE:                 English
AB   Chiral, facial tris-cyclometalated Ir(III) complexes,
     fac-Δ-Ir(pppy)3, fac-Λ-Ir(pppy)3, fac-Λ-IrL
     (where pppy is (8R,10R)-2-(2'-phenyl)-4,5-pinenopyridine and L is a
     tripodal ligand comprising three pppy moieties connected through a
     mesityl spacer) have been synthesized and characterized.  In IrL,
     NMR and CD studies indicate that only one diastereomer is formed,
     with the Λ configuration at the metal center, whereas
     enantiopure pppy yields the fac-Λ- and the
     fac-Δ-stereoisomers in a ratio of 2:3.  Fac-Λ-IrL was
     structurally characterized using x-ray crystallog.  The luminescence
     properties, including CPL, of the three complexes and their
     sensitivity to dioxygen were examined
```

IT **749250-93-9P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(crystal structure; diastereoselective formation and photophys. property of mesityl spacer containing chiral tris-cyclometalated iridium pinenopyridine complexes)
RN 749250-93-9 HCAPLUS
CN Iridium, [1,3,5-benzenetriyltris[methyleneoxy-2,1-ethanediyloxy-2,1-ethanediyl[(5S,6R,8R)-5,6,7,8-tetrahydro-7,7-dimethyl-6,8-methanoisoquinolin-5,3-diyl-κN2]-2,1-phenylene-κC]]-, (OC-6-22-Λ)- (9CI) (CA INDEX NAME)

PAGE 1-A

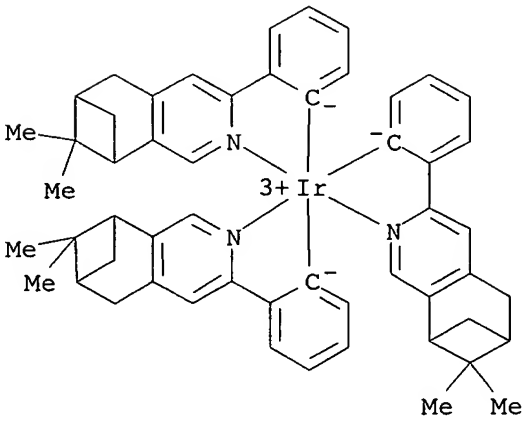


PAGE 2-A

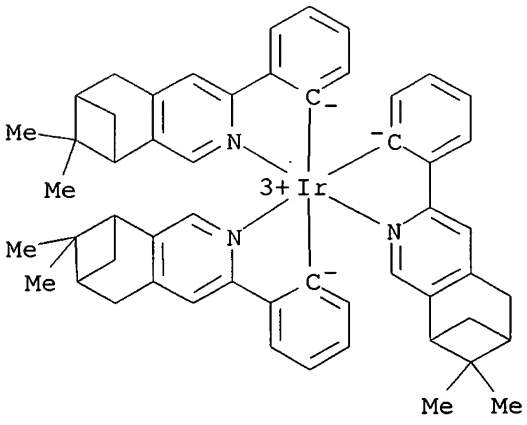


IT **749862-60-0P 749862-62-2P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(diastereoselective formation and photophys. property of mesityl spacer containing chiral tris-cyclometalated iridium pinenopyridine complexes)
RN 749862-60-0 HCAPLUS
CN Iridium, tris[2-[(6R,8R)-5,6,7,8-tetrahydro-7,7-dimethyl-6,8-

methanoisoquinolin-3-yl-κN]phenyl-κC]-,
(OC-6-21-Λ)- (9CI) (CA INDEX NAME)



RN 749862-62-2 HCAPLUS
CN Iridium, tris[2-[(6R,8R)-5,6,7,8-tetrahydro-7,7-dimethyl-6,8-methanoisoquinolin-3-yl-κN]phenyl-κC]-,
(OC-6-21-Δ)- (9CI) (CA INDEX NAME)



CC 29-13 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 72, 73, 75
IT **749250-93-9P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(crystal structure; diastereoselective formation and photophys. property of mesityl spacer containing chiral tris-cyclometalated iridium pinenopyridine complexes)
IT **749862-60-0P 749862-62-2P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(diastereoselective formation and photophys. property of mesityl spacer containing chiral tris-cyclometalated iridium pinenopyridine complexes)
REFERENCE COUNT: 65 THERE ARE 65 CITED REFERENCES AVAILABLE

FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

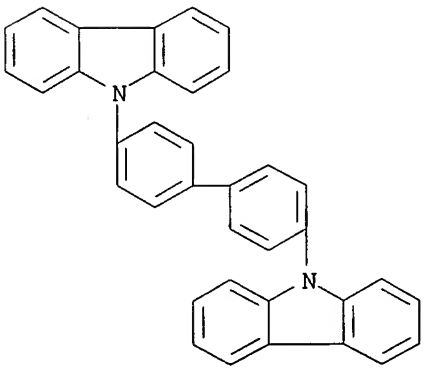
L43 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:773840 HCAPLUS
DOCUMENT NUMBER: 139:298982
TITLE: **Electroluminescent** device with carrier transport layer
INVENTOR(S): Ide, Nobuhiro; Kido, Junji; Tsubaki, Kenji; Kondo, Yukihiro; Kishiue, Yasuhisa; Kono, Kenji
PATENT ASSIGNEE(S): Matsushita Electric Works, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003282267	A2	20031003	JP 2002-81856	200203 22
PRIORITY APPLN. INFO.:			JP 2002-81856	200203 22

AB The invention refers to an **electroluminescent** device comprising an **organic luminescent** layer between an anode and a cathode, wherein the **organic luminescent** layer contains 20 - 99.9% mol. of an organic compound which provides **luminescence** and a carrier transport aiding agent having a energy gap larger than that of the organic compound in order to minimize the **luminescence** fluctuation and to eliminate the need for guest-**host** doping and ultra thin film **laminates**.

IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: DEV (Device component use); USES (Uses)
(**electroluminescent** device with carrier transport layer)

RN 58328-31-7 HCAPLUS
CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)

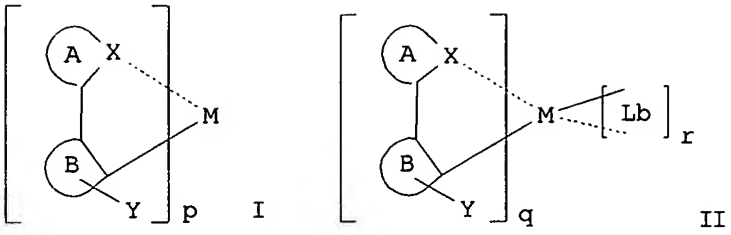


IC ICM H05B033-14
ICS H05B033-22
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST **electroluminescent** device carrier transport
IT **Electroluminescent** devices
(**electroluminescent** device with carrier transport layer)
IT Electric current carriers
(transport; **electroluminescent** device with carrier transport layer)
IT 2085-33-8, Aluminum tris(8-hydroxyquinolinato) 4733-39-5, Bathocuproin **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl 144810-07-1
RL: DEV (Device component use); USES (Uses)
(**electroluminescent** device with carrier transport layer)

L43 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:155115 HCAPLUS
DOCUMENT NUMBER: 138:212530
TITLE: Luminescent organometallic compound and light emitting device
INVENTOR(S): Fujii, Hiroyuki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 15 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003040627	A1	20030227	US 2002-170396	200206 14
JP 2004059433	A2	20040226	JP 2002-172832	200206 13
CN 1397559	A	20030219	CN 2002-124374	200206 17
PRIORITY APPLN. INFO.:			JP 2001-182507 A	200106 15
			JP 2002-165353 A	200206 06

OTHER SOURCE(S): MARPAT 138:212530
GI

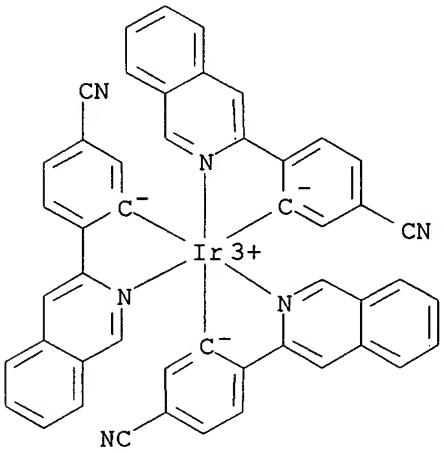


AB Luminescent organometallic compds. are described by the general formulas I and II (A and B represent ring structures, M = a metal atom; X = a hetero atom other than C or H; Y = ≥1 electron-attracting group connecting to ring structure B; Lb = a unidentate or multidentate ligand; and p, q and r = pos. integers). Light-emitting devices with emitting layers incorporating the compds. are also described.

IT **500295-42-1**
RL: DEV (Device component use); USES (Uses)
(luminescent organometallic compds. with heteroaryl derivative ligands and light-emitting devices using them)

RN 500295-42-1 HCAPLUS

CN Iridium, tris[2-(3-isoquinolinyl-κN)-5-cyanophenyl-κC]- (9CI) (CA INDEX NAME)



IC ICM C07F009-6568

NCL 546002000; 548402000; 549003000; 556013000

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 29, 76

IT 7440-04-2D, Osmium, compds. with heteroaryl derivs. 405890-11-1
405927-91-5 500295-35-2 500295-36-3 500295-37-4 500295-38-5
500295-39-6 500295-40-9 500295-41-0 **500295-42-1**
500295-43-2 500295-44-3 500295-45-4 500295-46-5 500295-48-7
500295-49-8 500295-50-1 500295-51-2 500295-52-3 500295-53-4
500295-54-5 500295-55-6 500295-56-7 500295-57-8 500295-58-9
500295-59-0 500295-60-3 500295-61-4 500295-62-5 500295-63-6
500295-64-7

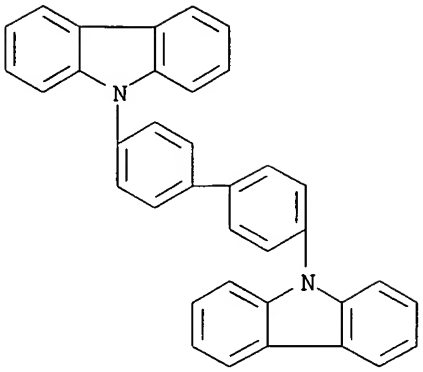
RL: DEV (Device component use); USES (Uses)
(luminescent organometallic compds. with heteroaryl derivative ligands and light-emitting devices using them)

L43 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:754786 HCAPLUS
DOCUMENT NUMBER: 137:270943
TITLE: Deposition apparatus and method for manufacturing an **organic luminescent** element which requires a lower drive voltage and has a longer life
INVENTOR(S): Yamazaki, Shunpei; Seo, Satoshi; Mizukami, Mayumi
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 42 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002139303	A1	20021003	US 2002-62005	20020131
CN 1369573	A	20020918	CN 2002-103325	20020131
JP 2002302757	A2	20021018	JP 2002-22741	20020131
TW 552650	B	20030911	TW 2002-91101696	20020131
PRIORITY APPLN. INFO.:			JP 2001-26184 A	20010201

AB A deposition apparatus is provided for manufacturing an organic compound **layer** having a **plurality** of function regions. The deposition apparatus includes a plurality of evaporation sources within a deposition chamber, for enabling continuous formation of resp. function regions comprised of organic compds. and, further, formation of a mixed region at an interface between adjacent ones of the function regions. With the deposition apparatus having such fabrication chamber, it is possible to prevent impurity contamination between the functions regions and further possible to form an organic compound layer with an energy gap relaxed at the interface.

IT **58328-31-7**
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(**host**; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)
RN 58328-31-7 HCAPLUS
CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



IC ICM C23C016-00
ICS B05D005-06
NCL 118719000
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 74
ST org compd layer vacuum evapn deposition **luminescent** device
IT **Luminescent** substances
(deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)
IT Amines, processes
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(diamines, aromatic, hole transportability; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)
IT **Electroluminescent** devices
(thin-film; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)
IT Vapor deposition apparatus
Vapor deposition process
(vacuum; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)
IT 4733-39-5, Bathocuproin
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(blocking ability; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)
IT 12798-95-7, Aluminum alloy, Al, Li
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(conductive film; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)
IT 91-22-5D, Quinoline, derivs., complexes 2085-33-8, Tris(8-quinolinolato) aluminum 11120-54-0D, Oxadiazole, derivs., complexes 12678-01-2D, Phenanthroline, derivs., complexes 37306-44-8D, Triazole, derivs., complexes 39327-16-7D, Benzoquinoline, derivs., complexes
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process);

FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(electron transportability; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)

IT 147-14-8, Copper phthalocyanine 123847-85-8, 4,4'-Bis [N-(1-naphthyl)-N-phenylamino]biphenyl 124729-98-2, MTDATA
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(hole transportability; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)

IT **58328-31-7**
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(**host**; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)

IT 95-16-9D, Benzothiazole, derivs., complexes 273-53-0D, Benzoxazole, derivs., complexes 31248-39-2, 2,3,7,8,12,13,17,18-Octaethyl-21H,23H-porphyrin-platinum 94928-86-6, Tris (2-phenylpyridine)**iridium**
RL: DEV (Device component use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(**luminescent** ability; deposition apparatus and method for manufacturing **luminescent** element having plurality of function regions)

L43 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:719427 HCAPLUS
DOCUMENT NUMBER: 138:63510
TITLE: **Light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems
AUTHOR(S): Vaeth, Kathleen M.; Tang, C. W.
CORPORATE SOURCE: Research and Development, and Electronic Imaging Products, Research and Development, Imaging Materials and Media, Eastman Kodak Company, Rochester, NY, 14650, USA
SOURCE: Journal of Applied Physics (2002), 92(7), 3447-3453
CODEN: JAPIAU; ISSN: 0021-8979
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

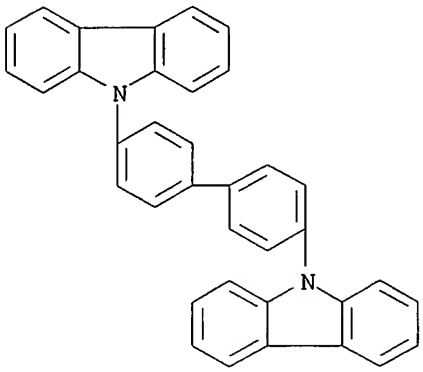
AB Fabrication of polymer **light-emitting** diodes based on emission from the **phosphorescent** mol. fac tris(2-phenylpyridine) Ir doped into a poly(vinyl carbazole) **host** are reported. **Several** spin-**coating** solvents were evaluated for deposition of the polymer layer; toluene and chlorobenzene consistently produce device-quality films with sufficient incorporation of the dopant. For single-layered devices with Mg0.9Ag0.1 cathodes, the **luminance** efficiency at 20 mA/cm2 is 8.7 Cd/A for devices processed from chlorobenzene. This efficiency could be increased by over a factor of two with a tri-layered device geometry consisting of the doped polymer layer, a hole-blocking layer, and electron transport layer. Further increases in efficiency, up to 30 Cd/A and 8.5% external quantum efficiency, were observed when a 2nd dopant of 2-(4-biphenylyl)-5-(4-

tert-butylphenyl)-1,3,4-oxadiazole was added to the polymer emitter layer.

IT **58328-31-7**, CBP (dye)
RL: DEV (Device component use); USES (Uses)
(CBP; **light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems)

RN 58328-31-7 HCAPLUS

CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **light emitting** diode LED **phosphorescent** guest polymeric **host**

IT **Electroluminescent** devices
Luminescence
Luminescence, electroluminescence
(**light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems)

IT 122648-99-1
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(ADN; **light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems)

IT **58328-31-7**, CBP (dye)
RL: DEV (Device component use); USES (Uses)
(CBP; **light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems)

IT 182947-41-7, Magnesium 90, silver 10 (atomic)
RL: DEV (Device component use); USES (Uses)
(**light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems)

IT 2085-33-8, Aluminum tris(8-hydroxyquinolinato) 15082-28-7, 2-(4-Biphenylyl)-5-(4-tert-butylphenyl)-1,3,4-oxadiazole 25067-59-8, Poly(vinyl carbazole) 80663-92-9 94928-86-6, Tris(2-phenylpyridine)**iridium** 192198-85-9, TPBi
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems)

IT 108-88-3, Toluene, uses 108-90-7, Chlorobenzene, uses
RL: NUU (Other use, unclassified); USES (Uses)
(spin coating solvent; **light-emitting** diodes based on **phosphorescent** guest/polymeric **host** systems)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

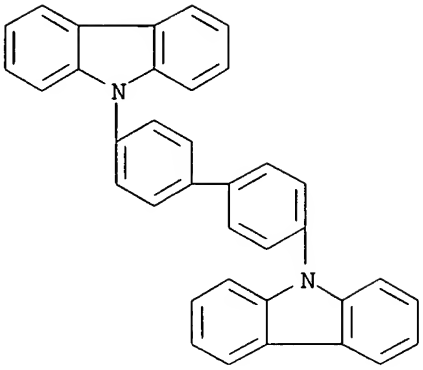
L43 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:656369 HCAPLUS
DOCUMENT NUMBER: 137:192553
TITLE: Organic **electroluminescent** devices using thermoplastic substrates and their manufacture
INVENTOR(S): Mishima, Masayuki
PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002246172	A2	20020830	JP 2001-37501	200102 14
PRIORITY APPLN. INFO.:			JP 2001-37501	200102 14

AB The organic **EL** device has a thermoplastic substrate having thereon transparent electrodes, ≥1 organic compound layers involving **luminescent** layers, back electrodes, and a thermoplastic sealing which seals the organic compound layer(s) and shields outside airs and is fused with the thermoplastic substrate around the periphery of the **luminescent laminate** to offer excellent brightness, **luminescent** efficiency and durability. The device is useful for full color displays, back **lights**, surface **light sources**, **light source** arrays for printers, etc.

IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: TEM (Technical or engineered material use); USES (Uses)
(**host** material; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

RN 58328-31-7 HCAPLUS
CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



IC ICM H05B033-04
ICS H05B033-02; H05B033-10; H05B033-14
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST org **electroluminescent** device thermoplastic substrate durability; sealing thermoplastic substrate org **electroluminescent** device
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Nitoflon, substrate; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)
IT Polycarbonates, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Panlite, substrate; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)
IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Tetoron Film, substrate; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)
IT Sealing
(manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)
IT **Electroluminescent** devices
(organic; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)
IT Plastics, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(thermoplastics, substrates; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)
IT 117944-65-7, Indium zinc oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(IZO, transparent electrode; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)
IT 7440-22-4, Silver, uses 12614-86-7
RL: TEM (Technical or engineered material use); USES (Uses)
(Mg-Ag/Ag **laminate** back electrode; manufacture of organic

EL devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT 1312-43-2, Indium oxide (In2O3)
RL: TEM (Technical or engineered material use); USES (Uses)
(Zn-doped In2O3 transparent electrode; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT 7440-66-6, Zinc, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(dopant, Zn-doped In2O3 transparent electrode; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT 358974-66-0, 2,2',2''-(1,3,5-Benzenetriyl)tris[3-(2-methylphenyl)-3H-imidazo[4,5-b]pyridine]
RL: TEM (Technical or engineered material use); USES (Uses)
(electron transporting layer; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT 15082-28-7, 2-(4-Biphenylyl)-5-(4-tert-butylphenyl)-1,3,4-oxadiazole 123847-85-8
RL: TEM (Technical or engineered material use); USES (Uses)
(electron-transporting material; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT 155090-83-8, Baytron P
RL: TEM (Technical or engineered material use); USES (Uses)
(hole injection layer; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT 25067-59-8, Poly(vinylcarbazole)
RL: TEM (Technical or engineered material use); USES (Uses)
(hole transporting/**host** material; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: TEM (Technical or engineered material use); USES (Uses)
(**host** material; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

IT 94928-86-6, Tris(2-phenylpyridine)**iridium**
RL: TEM (Technical or engineered material use); USES (Uses)
(**phosphor**; manufacture of organic **EL** devices using thermoplastic substrates sealed with thermoplastic sealings for enhanced durability)

L43 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:575513 HCAPLUS
DOCUMENT NUMBER: 137:131918
TITLE: Organic **light emitting** element and display device using the element
INVENTOR(S): Seo, Satoshi; Yamazaki, Shunpei
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 49 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

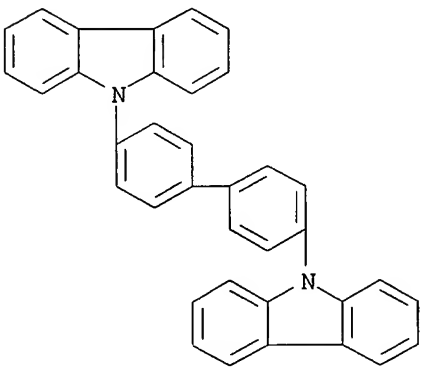
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002101154	A1	20020801	US 2002-60427	200201 29
TW 520614	B	20030211	TW 2002-91101688	200201 31
JP 2002305085	A2	20021018	JP 2002-25701	200202 01
CN 1378409	A	20021106	CN 2002-118312	200202 01
PRIORITY APPLN. INFO.:			JP 2001-25971 A	200102 01

AB Organic **light-emitting** devices are described in which the organic layers include a mixed region (e.g., a layer in which both a hole-transporting material and electron-transporting material are mixed, a region in which a hole-transporting material and the **host** material for the **light-emitting** material are mixed, etc.). Interfaces between resp. layers which exist in a conventional **multilayered** structure are eliminated. Preferably, the **light-emitting** layer(s) include a red-emitting triplet material. Electronic equipment (organic **electroluminescent** displays, video cameras, digital cameras, image reproduction apparatus, portable computers, personal computers, mobile telephones, and acoustic equipment) employing the devices is also described.

IT **58328-31-7**
RL: DEV (Device component use); USES (Uses)
(organic **light-emitting** devices with mixed organic layers and display devices using them)

RN 58328-31-7 HCAPLUS

CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



IC ICM H01J001-62

NCL 313506000

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related

Properties)
Section cross-reference(s): 74, 76
ST org **light emitting** device display mixed layer
IT **Electroluminescent** devices
(displays, organic; organic **light-emitting** devices with mixed organic layers and display devices using them)
IT **Luminescent** screens
(**electroluminescent, organic**; organic **light -emitting** devices with mixed organic layers and display devices using them)
IT **Electroluminescent** devices
(organic; organic **light-emitting** devices with mixed organic layers and display devices using them)
IT 147-14-8, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 4733-39-5, Bathocuproin 7440-69-9, Bismuth, uses 12798-95-7 31248-39-2, 2,3,7,8,12,13,17,18-Octaethyl-21H,23H-porphyrinplatinum 50926-11-9, ITO 52934-06-2, Gallium zinc oxide **58328-31-7** 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl 146162-54-1
RL: DEV (Device component use); USES (Uses)
(organic **light-emitting** devices with mixed organic layers and display devices using them)

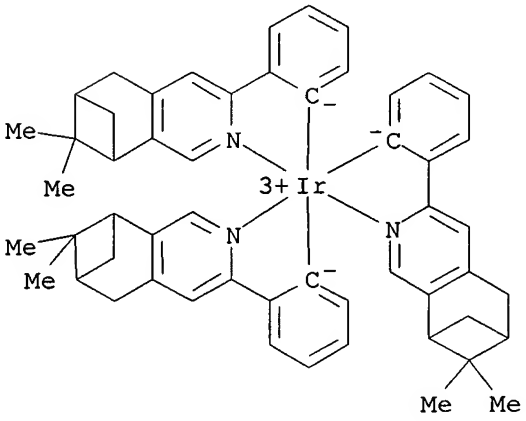
L43 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:682100 HCAPLUS
DOCUMENT NUMBER: 136:12454
TITLE: Reduction of self-quenching effect in organic electrophorescence emitting devices via the use of sterically hindered spacers in phosphorescence molecules
AUTHOR(S): Xie, Hong Zhi; Liu, Man Wah; Wang, Oi Yan; Zhang, Xiao Hong; Lee, Chun Sing; Hung, Liang Sun; Lee, Shuit Tong; Teng, Pang Fei; Kwong, Hoi Lun; Zheng, Hui; Che, Chi Min
CORPORATE SOURCE: Center of Super-Diamond and Advanced Films and Department of Physics and Materials Science, City University of Hong Kong, Hong Kong, Peop. Rep. China
SOURCE: Advanced Materials (Weinheim, Germany) (2001), 13(16), 1245-1248
CODEN: ADVMEW; ISSN: 0935-9648
PUBLISHER: Wiley-VCH Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The photoluminescence (PL) and electroluminescence (EL) properties of new Ir complex, Ir(mppy)3, prepared by introducing a pinene group as spacer on the framework of 2-phenylpyridine, were examined The identity of the product was carried out by 1H NMR. Mass spectral anal. showed a mol. ionic peak at a m/e ratio of 937.6 corresponding to Ir(mppy)3+ with fragments at a m/e ratio of 689.5 and 434.3, resp. corresponding to Ir(mpp)2+ and Irmppy+. The absorption and PL spectra of Ir(mppy)3 were measured in degassed MeOH solution in its solid state at room temperature, and in ice glass at 77 K. To study the EL properties, the new Ir compound was used as an emitting dopant for fabricating EL devices with various doping concns. In these devices, 4,4'-dicarbazolyl-1,1-biphenyl (CBP) acted as a host material. N,N'-di-1-naphythyl-N,N'-diphenyl-biphenyl-4,4'-diamine and tris(8-hydroxyquinolato)aluminum(III) were used as hole-transport layer and an electron transport layer, resp.

Current-voltage characteristics of the Ir complex doped devices were measured and they were fairly insensitive to the doping concentration of Ir(mppy)3. The luminance-current studies revealed a gradual increase of brightness when the concentration of Ir(mppy)3 in CBP was increased. Ir(mppy)3 exhibited very strong green phosphorescence emission with a PL quantum yield of 0.71 in solution and a relative short lifetime of 0.33 μs in solid. Self-quenching was significantly reduced for this compound in solution even at high concentration because the sterically hindered pinene spacer in the phosphor mol. led to min. bimol. interaction,. Bright green emission was observed from EL devices based on this Ir complex, and external quantum efficiency increased with increasing Ir(mppy)3 concentration, confirming that the aggregation quenching was almost negligible in these phosphorescence devices.

IT **376385-24-9P**
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(reduction of self-quenching effect in organic electrophorescence emitting devices via use of sterically hindered spacers in phosphorescence mols.)

RN 376385-24-9 HCAPLUS

CN Iridium, tris[2-[(6R,8R)-5,6,7,8-tetrahydro-7,7-dimethyl-6,8-methanoisoquinolin-3-yl-κN]phenyl-κC]-, (OC-6-22)- (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 25, 76

IT **376385-24-9P**
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(reduction of self-quenching effect in organic electrophorescence emitting devices via use of sterically hindered spacers in phosphorescence mols.)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:400133 HCAPLUS
DOCUMENT NUMBER: 135:202186

TITLE: Optimization of driving lifetime durability in organic LED devices using Ir complex

AUTHOR(S): Watanabe, Teruichi; Nakamura, Kenji; Kawami, Shin; Fukuda, Yoshinori; Tsuji, Taishi; Wakimoto, Takeo; Miyaguchi, Satoshi

CORPORATE SOURCE: Corporate R&D Laboratories, Pioneer Corporation, Tsurugashima, Saitama, 350-02, Japan

SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (2001), 4105(Organic Light-Emitting Materials and Devices IV), 175-182
CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical Engineering

DOCUMENT TYPE: Journal

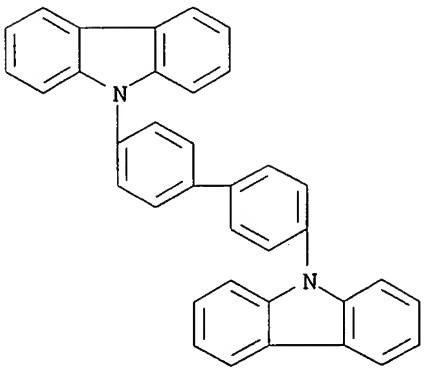
LANGUAGE: English

AB **Multilayer** organic **light-emitting** device with **phosphorescent** guest emitter, tris(2-phenylpyridine) **iridium** [Ir(ppy)3] doped in a **host** 4,4'-N,N'-dicarbazolylbiphenyl (CBP) layer, exhibited very high **luminous** efficiency. A device having such **phosphorescent** guest emitter could not offer sufficiently long driving lifetime required by real products. **Phosphorescence** in organic mols. rarely occurs at room temperature Ways were studied to increase driving lifetime by 3 types of expts. Whether the driving lifetime is dependent on guest mol. concentration was studied. Cu phthalocyanine (CuPc) was inserted between In Sn Oxide (ITO) anode and hole transport layer, 4,4'-bis[N-(naphthyl)-N-phenylamino]biphenyl (NPB) to prevent driving voltage from rising during constant current operation. The hole blocking layer, which is 2,9-dimethyl-4,7-diphenyl-1,10-phenanthroline (BCP), was exchanged for [(1,1'-biphenyl)-4-olato]bis(2-methyl-8-quinolinolato-N1,O8)aluminum (BAlq). Optimizing all of the above mentioned steps, the half decay lifetime of ≥20,000 h at an initial **luminance** of 100 cd/m2 by constant current driving can be expected.

IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: DEV (Device component use); USES (Uses)
(optimization of driving lifetime durability in organic **LED** devices using **iridium** phenylpyridine complex in)

RN 58328-31-7 HCAPLUS

CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST diode **light emitting iridium** phenylpyridine complex driving lifetime durability; LED **iridium** phenylpyridine complex driving lifetime durability optimization
IT **Luminescence, electroluminescence**
Phosphorescence
(of **organic LED** devices using **iridium** phenylpyridine complex)
IT **Electroluminescent** devices
(optimization of driving lifetime durability using **iridium** phenylpyridine complex in)
IT 94928-86-6, Tris(2-phenylpyridine)**iridium**
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(optimization of driving lifetime durability in organic **LED** devices using)
IT 147-14-8, Copper phthalocyanine 4733-39-5, 2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline 12057-24-8, Lithium oxide, uses 50926-11-9, Indium tin oxide 123847-85-8 146162-54-1
RL: DEV (Device component use); USES (Uses)
(optimization of driving lifetime durability in organic **LED** devices using **iridium** phenylpyridine complex and containing)
IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: DEV (Device component use); USES (Uses)
(optimization of driving lifetime durability in organic **LED** devices using **iridium** phenylpyridine complex in)
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

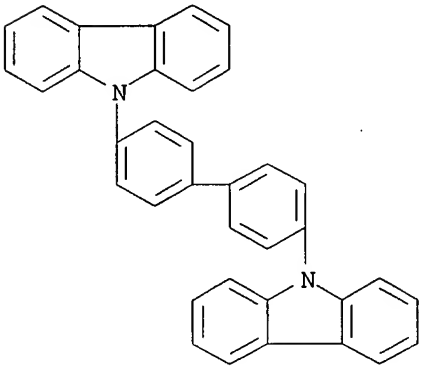
L43 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:163834 HCAPLUS
DOCUMENT NUMBER: 135:172723
TITLE: Optimization of emitting efficiency in organic LED cells using Ir complex
AUTHOR(S): Watanabe, T.; Nakamura, K.; Kawami, S.; Fukuda, Y.; Tsuji, T.; Wakimoto, T.; Miyaguchi, S.; Yahiro, M.; Yang, M.-J.; Tsutsui, T.
CORPORATE SOURCE: Corporate R&D Laboratories, Pioneer Corporation, Tsurugashima, Saitama, Japan
SOURCE: Synthetic Metals (2001), 122(1), 203-207
CODEN: SYMEDZ; ISSN: 0379-6779
PUBLISHER: Elsevier Science S.A.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB **Multilayer** organic **light-emitting** devices (**OLED**) with **phosphorescent** guest emitter, tris(2-phenylpyridine) Ir doped in a **host** 4,4'-N,N'-dicarbazol-biphenyl layer, were prepared The authors optimized the cell structure paying special attention to the multiple reflection at the **multilayers'** interfaces and succeeded in improving the **luminance** efficiency. The authors' method consists of adjusting optical distances between emission sites and dominant reflective surfaces, organic/cathode and

ITO/glass interfaces. The device with the 8.7 weight % Guest emitter exhibited external quantum efficiency and power **luminous** efficiency of 14.9% and 43.4 lm/W, resp. at the **luminance** of 100 cd/m2 driven at the voltage of 4.2 V In addition, the authors studied the emission site in the electrophosphorescent cells and recalcd. the external quantum efficiency by the actual emission pattern.

IT **58328-31-7**
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(optimization of emitting efficiency in organic **LED** cells using Ir complex)

RN 58328-31-7 HCAPLUS

CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST optimization emission org LED **iridium** complex

IT **Electroluminescent** devices
Interference
Optimization
Phosphorescence
(optimization of emitting efficiency in organic **LED** cells using Ir complex)

IT 7429-90-5, Aluminum, uses 12057-24-8, Lithium oxide, uses 50926-11-9, Indium tin oxide
RL: DEV (Device component use); USES (Uses)
(optimization of emitting efficiency in organic **LED** cells using Ir complex)

IT 94928-86-6, Tris(2-phenylpyridine) **iridium**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(optimization of emitting efficiency in organic **LED** cells using Ir complex)

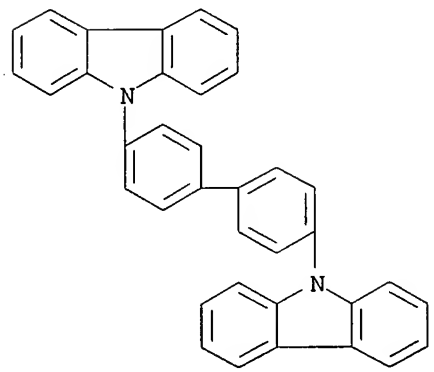
IT 2085-33-8, Aluminum tris(8-hydroxyquinolinato) 4733-39-5, 2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline **58328-31-7** 123847-85-8, NPB
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(optimization of emitting efficiency in organic **LED** cells using Ir complex)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:648118 HCAPLUS
DOCUMENT NUMBER: 133:327530
TITLE: High quantum efficiency in organic **light-emitting** devices with **iridium**-complex as a triplet emissive center
AUTHOR(S): Tsutsui, Tetsuo; Yang, Moon-Jae; Yahiro, Masayuki; Nakamura, Kenji; Watanabe, Teruichi; Tsuji, Taishi; Fukuda, Yoshinori; Wakimoto, Takeo; Miyaguchi, Satoshi
CORPORATE SOURCE: Department of Applied Science for Electronics and Materials, Graduate School of Engineering Sciences, Kyushu University, Fukuoka, 816-8580, Japan
SOURCE: Japanese Journal of Applied Physics, Part 2: Letters (1999), 38(12B), L1502-L1504
CODEN: JAPLD8; ISSN: 0021-4922
PUBLISHER: Japan Society of Applied Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB **Multilayer** organic **light-emitting** devices with **phosphorescent** guest emitter, tris(2-phenylpyridine) **iridium** doped in a **host** 4,4'-N,N'-dicarbazolbiphenyl layer were prepared The device with the 6.5 wt% guest emitter exhibited external quantum efficiency and power **luminous** efficiency of 13.7% and 38.31 m/W, resp. at the **luminance** of 105 cd/m2 driven at the voltage of 4.0 V and c.d. of 0.215 mA/cm2. The half decay lifetime under continuous constant-current driving for the initial **luminance** of 500 cd/m2 was 170 h.

IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: DEV (Device component use); USES (Uses)
(charge carrier; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine) **iridium** as triplet emissive center)
RN 58328-31-7 HCAPLUS
CN 9H-Carbazole, 9,9'-[1,1'-biphenyl]-4,4'-diylbis- (9CI) (CA INDEX NAME)



CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

ST org **light emitting** device phenylpyridine **iridium** complex **phosphorescence** triplet; quantum efficiency **phosphorescent iridium** complex org **light emitting** device; LED quantum efficiency **phosphorescent iridium** complex; **electroluminescent** display LED quantum efficiency **phosphorescent iridium** complex

IT **Luminescence, electroluminescence**
Triplet state excitation
(high quantum efficiency of **LED** containing tris(phenylpyridine)**iridium** as **phosphorescent** emissive center)

IT **Phosphorescence**
Triplet state transition
(high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine)**iridium** as triplet emissive center)

IT **Electroluminescent** devices
(organic; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine) **iridium** as triplet emissive center)

IT Triplet state
Triplet state
(triplet-triplet energy transfer; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine)**iridium** as triplet emissive center)

IT Energy transfer
Energy transfer
(triplet-triplet; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine) **iridium** as triplet emissive center)

IT 50926-11-9, ITO
RL: DEV (Device component use); USES (Uses)
(anode; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine) **iridium** as triplet emissive center)

IT 12057-24-8, Lithium oxide, uses
RL: DEV (Device component use); USES (Uses)
(cathode material; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine) **iridium** as triplet emissive center)

IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); USES (Uses)
(cathode; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine) **iridium** as triplet emissive center)

IT **58328-31-7**, 4,4'-N,N'-Dicarbazolylbiphenyl
RL: DEV (Device component use); USES (Uses)
(charge carrier; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine) **iridium** as triplet emissive center)

IT 2085-33-8, Tris-(8-hydroxyquinoline) aluminum
RL: DEV (Device component use); USES (Uses)
(electron transport agent; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine)**iridium** as triplet emissive center)

IT 4733-39-5, 2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline
RL: DEV (Device component use); USES (Uses)
(electron transport/hole blocking layer; high quantum efficiency

of organic **light-emitting** devices containing tris(phenylpyridine)**iridium** as triplet emissive center)

IT 123847-85-8, α-NPD
RL: DEV (Device component use); USES (Uses)
(hole transport agent; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine)**iridium** as triplet emissive center)

IT 94928-86-6
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(triplet emitter; high quantum efficiency of organic **light-emitting** devices containing tris(phenylpyridine)**iridium** as triplet emissive center)

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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